

A B S T R A C T

The present invention relates to a method of producing solid carbonaceous  $C_xH_y$ , wherein the ratio of  $x:y$  is greater than 2.5:1, or a hydrogen-rich gas, wherein a hydrocarbon fuel is heated with limiting amounts of oxidizer to a temperature of at least about 1000°C whereby to effect incomplete combustion and pyrolytic decomposition of said hydrocarbon fuel, the carbonaceous product produced by that method, a method of combusting the gas produced by that method and reactors for performing these methods.

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